

## 2.5V 500mA Low Dropout Regulator

### Features

- Dropout voltage typically 0.45V @  $I_o = 500\text{mA}$
- Output current in 500mA
- Output voltage accuracy  $\pm 2\%$
- Quiescent current, typically 0.6mA
- Internal short circuit current limit
- Internal over temperature protection

### General Description

The G905 positive 2.5V voltage regulator features the ability to source 500mA of output current with a dropout voltage of typically 0.45V. A low quiescent current is provided. The typical quiescent current is 0.6mA.

Familiar regulator features such as over temperature and over current protection circuits are provided to prevent it from being damaged by abnormal operating conditions.

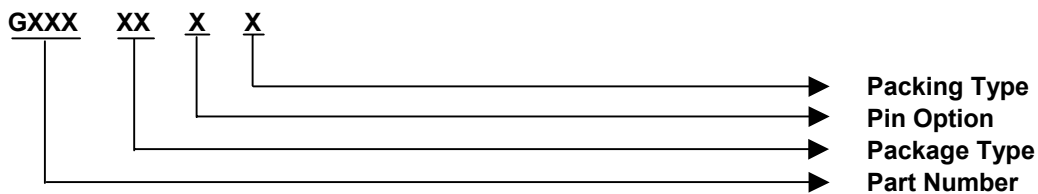
### Application

- CD-R/W
- DVD-ROM
- DVD player
- LAN Switch
- Broadband access

### Ordering Information

ORDER NUMBER	PACKAGE TYPE	PIN OPTION		
		1	2	3
G905T24U	SOT 89	GND	$V_{IN}$	$V_{OUT}$

### Order Number Identification



#### PACKAGE TYPE

T2 : SOT 89

#### PIN OPTION

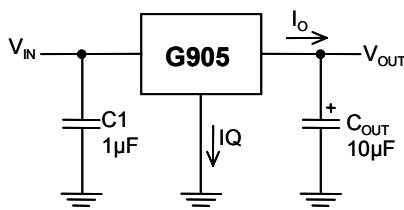
1            2            3  
4 : GND     $V_{IN}$          $V_{OUT}$

#### PACKING

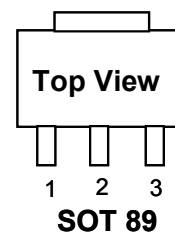
U & D : Tape & Reel Direction

### Typical Application

[Note 4] : Type of  $C_{OUT}$



### Package Type



<b>Absolute Maximum Ratings</b>	(Note 1)
Input Voltage.....	7V
Power Dissipation Internally Limited.....	(Note2)
Maximum Junction Temperature.....	150°C
Storage Temperature Range.....	-65°C ≤ T <sub>J</sub> ≤ +150°C
Lead Temperature, Time for Wave Soldering	
SOT-89 Package.....	260°C, 10s
Continuous Power Dissipation (T <sub>A</sub> =+25°C)	
SOT-89 <sup>(1)</sup> .....	0.5W

<b>Operating Conditions</b>	(Note 1)
Input Voltage.....	2.7V ~ 6V
Temperature Range.....	0°C ≤ T <sub>J</sub> ≤ 125°C

Note (1): See Recommended Minimum Footprint

## Electrical Characteristics

V<sub>IN</sub> = 5V, I<sub>O</sub> = 500mA, C<sub>IN</sub> = 1μF, C<sub>OUT</sub> = 10μF. All specifications apply for T<sub>A</sub> = T<sub>J</sub> = 25°C. [Note 3]

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	10mA ≤ I <sub>O</sub> ≤ 500mA	2.45	2.5	2.55	V
Line Regulation	3.3V ≤ V <sub>IN</sub> ≤ 6.5V, I <sub>O</sub> = 10mA		1	50	mV
Load Regulation	10mA ≤ I <sub>O</sub> ≤ 500mA		20	60	mV
Output Impedance	200mA DC and 100mA AC, f <sub>O</sub> = 120Hz		80		mΩ
Quiescent Current	V <sub>IN</sub> = 5V		0.6		mA
Ripple Rejection	f <sub>i</sub> = 120Hz, V <sub>ripple</sub> = 2V <sub>P-P</sub> , I <sub>O</sub> = 100mA		46		dB
Dropout Voltage	I <sub>O</sub> = 500mA		450		mV
	I <sub>O</sub> = 100mA		220		
Output Current	Continuous Test, V <sub>IN</sub> = 3.3V T <sub>A</sub> = 25°C, T <sub>J</sub> < 125°C, V <sub>OUT</sub> within ±2% (Note 3)	Minimum footprint	500		mA
Short Circuit Current			0.77		A
Over Temperature			150		°C

**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

**Note2:** The maximum power dissipation is a function of the maximum junction temperature, T<sub>Jmax</sub>; total thermal resistance, θ<sub>JA</sub>, and ambient temperature T<sub>A</sub>. The maximum allowable power dissipation at any ambient temperature is T<sub>Jmax</sub>-T<sub>A</sub> / θ<sub>JA</sub>. If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown. For the G905 in SOT-89 (T2) package, θ<sub>JA</sub> is 250°C/W (See recommend minimum footprint). The safe operation in SOT-89 package, it can see "Typical Performance Characteristics" (Safe Operating Area).

**Note3:** Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

**Note4:** The type of output capacitor should be tantalum or aluminum.

## Definitions

### Dropout Voltage

The input/output Voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 100mV below its nominal value, dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

### Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

### Maximum Power Dissipation

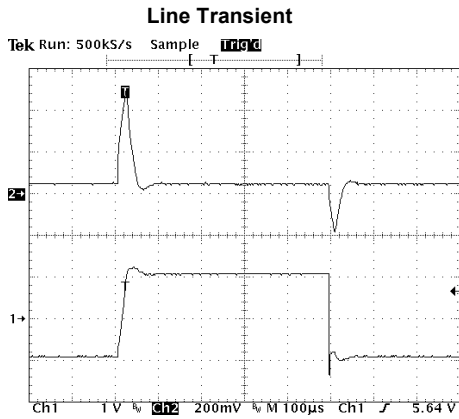
The maximum total device dissipation for which the regulator will operate within specifications.

### Quiescent Bias Current

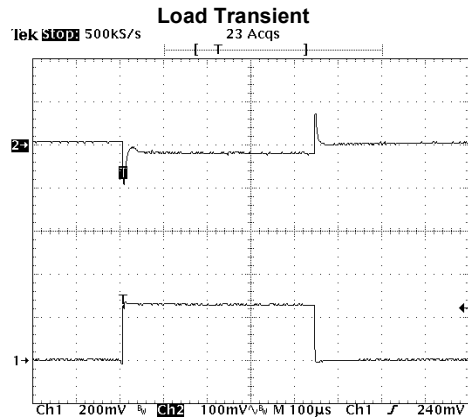
Current which is used to operate the regulator chip and is not delivered to the load.

**Typical Performance Characteristics**

( $V_{IN} = +5V$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.)

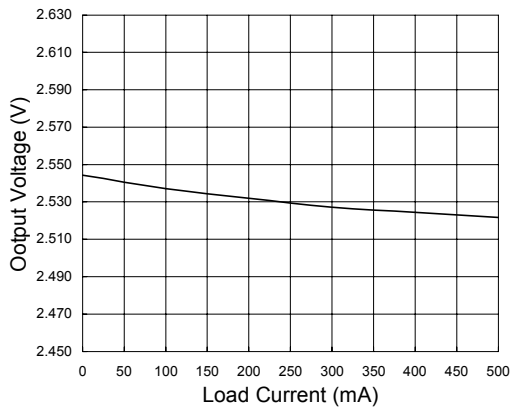


Ch1: Vin (offset=5.0V)  
 Ch2: Vout (offset=2.50V)  
 $C_{IN} = 1\mu F$   
 $I_{out} = 100mA$

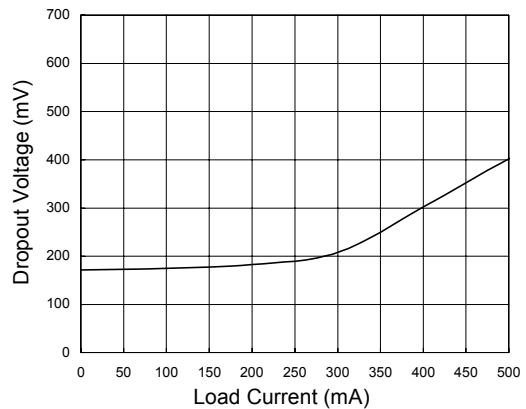


Ch1: Iout (400mA/div)  
 Ch2: Vout is AC coupled

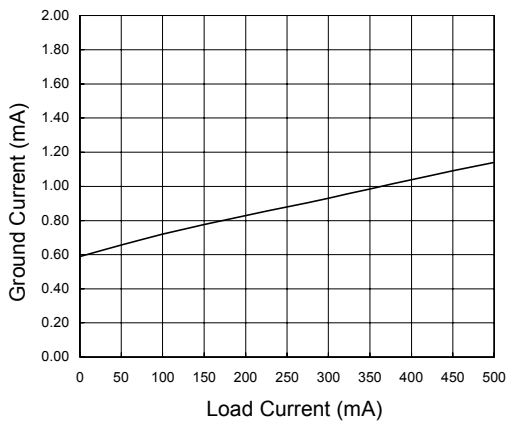
**Output Voltage vs. Load Current**



**Dropout Voltage vs. Load Current**

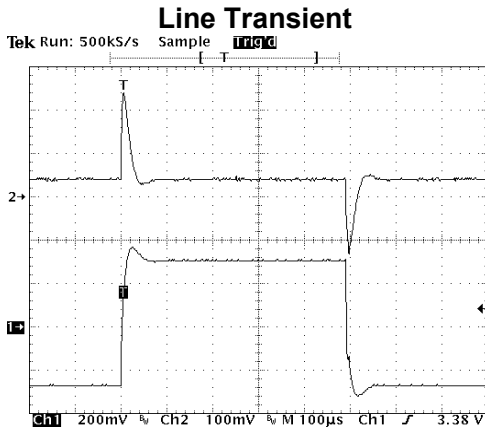


**Ground Current vs. Load Current**

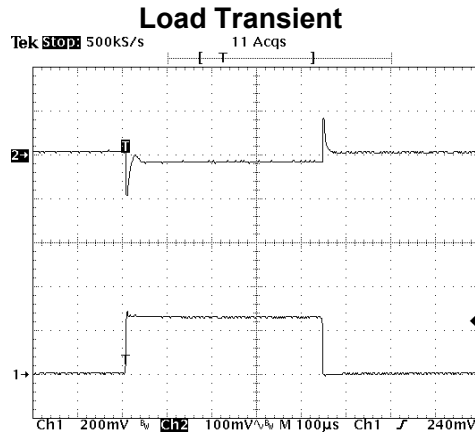


**Typical Performance Characteristics**

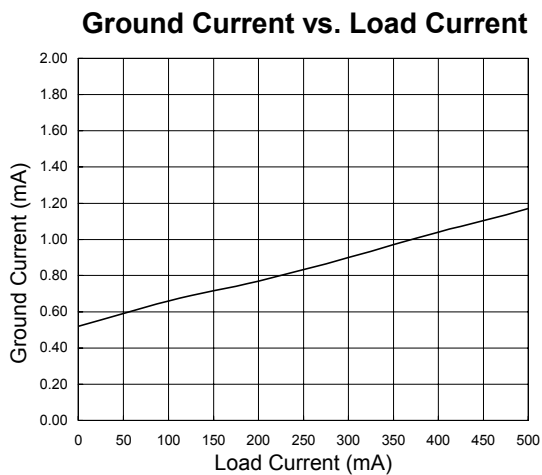
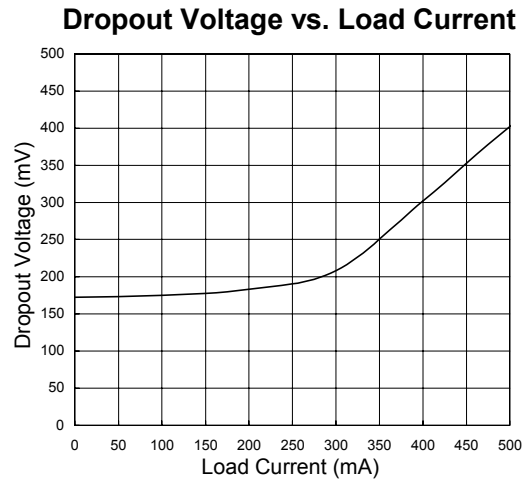
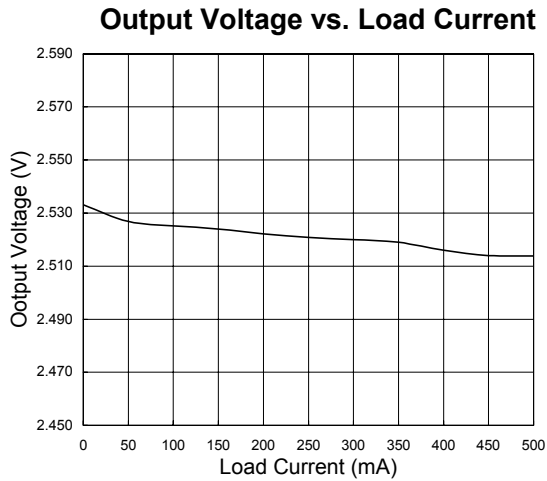
( $V_{IN} = +3.3V$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.)



Ch1: Vin (offset=3.3V)  
 Ch2: Vout (offset=2.50V)  
 $C_{IN} = 1\mu F$   
 $I_{out} = 100mA$



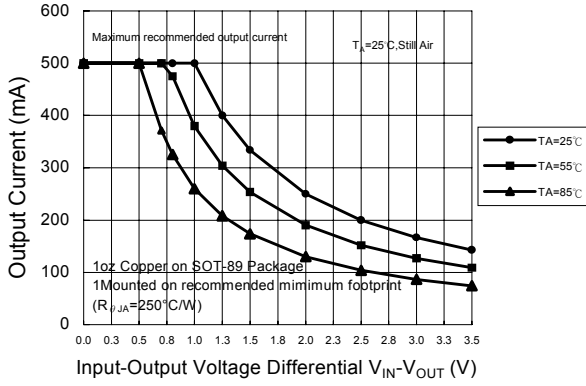
Ch1: Iout (400mA/div)  
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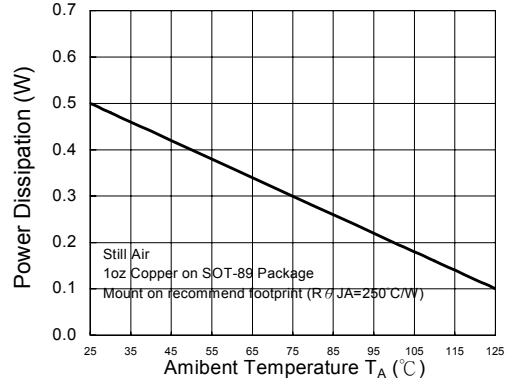
**Typical Performance Characteristics**

( $V_{IN} = +5V$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.)

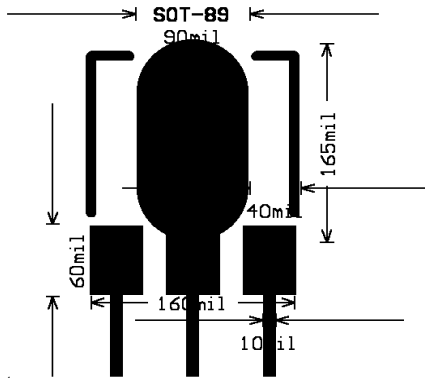
**Safe Operating of SOT-89**



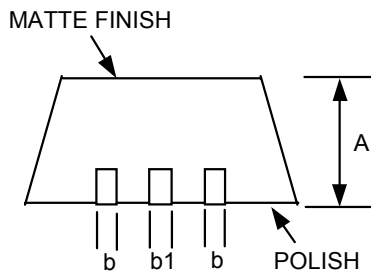
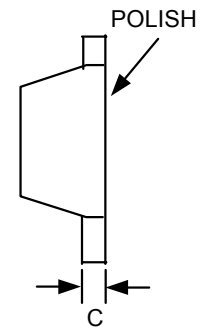
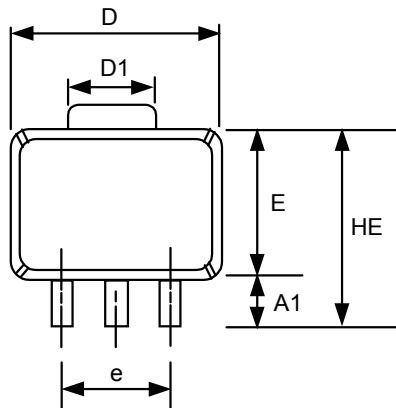
**Maximum Power Dissipation of SOT-89**



**Recommend Minimum Footprint**



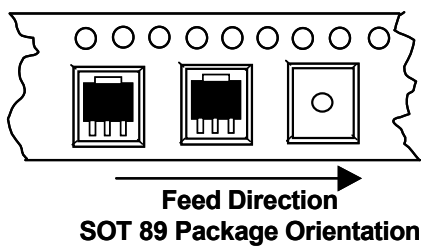
**Package Information**



**SOT- 89 (T2) Package**

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
A1	0.80	1.04	-----	0.031	0.041	-----
b	0.36	0.42	0.48	0.014	0.016	0.048
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	038	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
HE	-----	-----	4.25	-----	-----	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e	2.90	3.00	3.10	0.114	0.118	0.122

**Package Orientation**



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